



GCE AS MARKING SCHEME

SUMMER 2025

**AS
COMPUTER SCIENCE - COMPONENT 1
B500U10-1**

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

EDUQAS GCE AS COMPUTER SCIENCE - COMPONENT 1

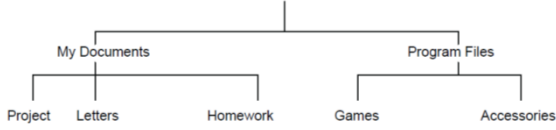
SUMMER 2025 MARK SCHEME

Q	Answer	Marks	AO1	AO2	AO3	Total
1 (a)	Award one mark for the following: $R = \overline{P}. Q$	1		2.1b		1
1 (b)	Award one mark for the following, up to maximum of one mark: $Z = \overline{X + Y}$ $Z = \overline{X}.\overline{Y}$	1		2.1b		1
2	Award one mark for each of the following, up to a maximum of three marks: Components and mechanisms - Data is stored on magnetic disks - Read/write heads are positioned above and below each platter - An actuator arm positions the read/write heads over the desired track - A spindle rotates the platters at a constant speed - The controller manages data transfer between the computer and the HDD - Data is stored as magnetic patterns on the platters Award one mark for each of the following, up to a maximum of three marks: Factors to slower speeds - Over time, as files are created, modified, and deleted, they may become fragmented - Parts of a file are stored in non-contiguous sectors on the disk - This impacts on overall access speeds - Fragmented files require additional movement of read/write heads, contributing to increased seek times and reduced performance - The physical movement of the actuator arm and the rotation of platters introduce mechanical delays - This leads to slower access speeds Award one mark for each of the following, up to a maximum of three marks: Enhancement method - Defragmentation - Files are physically re-arranged next to	3 3 3	1.1b 1.1b 1.1b			9

Q	Answer	Marks	AO1	AO2	AO3	Total
	each other on disk • Replace HDDs with SSDs • These use NAND-based flash memory for storage • SSDs have no moving parts, eliminating mechanical delays SSDs are not susceptible to fragmentation-related issues, providing faster access speeds					
3 (a)	Award one mark for the following: • A protocol is an agreed upon format which allows two devices to communicate.	1	1.1b			1
(b) (i)	Award one mark for the following: • FTP	1		2.1a		1
(ii)	Award one mark for the following: • UDP	1		2.1a		1
(iii)	Award one mark for the following: • IMAP	1		2.1a		1
(c)	Award one mark for the following: • When a computer system establishes a devices readiness to communicate	1	1.1b			1
(d)	Award one mark for each of the following, up to a maximum of two marks: • Collision • The transmitting nodes waits a random amount of time before trying to resend the packet	1 1	1.1a 1.1b			2
(e)	Award one mark for each of the following, up to a maximum of three marks: • Each packet has a destination address. • Packets are analysed by each node. • Packets are sent down the most appropriate path to reach its destination • Each node maintains a routing table • Packets may take different routes.	1 1 1	1.1b 1.1b 1.1b			3

Q	Answer	Marks	AO1	AO2	AO3	Total
6	Award one mark for each simplification, up to a maximum of eight marks: $P.\bar{P} + P.Q + R.P + R.Q + \bar{P}.Q + \bar{P}.R$ $0 + P.Q + R.P + R.Q + \bar{P}.Q + \bar{P}.R$ $P.Q + P.R + Q.R + \bar{P}.Q + \bar{P}.R$ $R.(P + Q + \bar{P}) + P.Q + \bar{P}.Q$ $R.(1) + P.Q + \bar{P}.Q$ $R.(1) + Q.(P + \bar{P})$ $R.(1) + Q.(1)$ $R + Q$	8		2.1a		8
7 (a)	Award one mark for each of the following, up to a maximum of five marks: 99_{10} FF_{16} Binary addition: $\begin{array}{r} 01100011_2 \\ 11111111_2 \\ \hline 101100010_2 \end{array}$	5		2.1a		5
(b) (i)	Award one mark for each of the following, up to a maximum of three marks: 00000111.101 - Mantissa = 0.1111010 - Exponent = 0011	1 1 1		2.1a 2.1a 2.1a		3
(ii)	Award one mark for each of the following, up to a maximum of three marks: - Mantissa = 0.71875 - Exponent = 2 - Answer = $0.71875 \times 2^2 = 2.875_{10}$	1 1 1		2.1a 2.1a 2.1a		3
8	Award one mark for each of the following, up to a maximum of five marks: - Four correct table names - One-to-many relationship connecting books and authors - One-to-many relationship connecting members and loans - Foreign key identified AuthorID in Book table or MemberID in Loan table - Suitable 'additional' fields in each table.	5		2.1b		5

Q	Answer	Marks	AO1	AO2	AO3	Total
9	Award one mark for each of the following, up to a maximum of four marks: • Study the existing system documentation ○ Team can see how current system 'should' be operating ○ Inexpensive method of gathering lots of information fairly quickly ○ Can identify storage requirements. • Carry out a questionnaire of staff ○ Relatively cheap to produce for a large number of people ○ Can be distributed worldwide ○ Could be completed on-line so results can be available very quickly ○ Gather a large number of responses in a short time. • Interview staff / focus groups ○ Can gather large amount of detailed information ○ Can make judgements on validity of information from personal contact or body language ○ Can ask 'follow up' or 'open ended' questions to gather more detailed information in selected areas. • Observe the current system in practice ○ Can actually see what is really happening and do not have to rely on what people tell you what they think is happening.	4	1.1b			4

Q	Answer	Marks	AO1	AO2	AO3	Total
11 (a)	Award one mark for the following:  <pre> graph TD Root[] --- MD[My Documents] Root --- PF[Program Files] MD --- Project MD --- Letters MD --- Homework PF --- Games PF --- Accessories </pre> Award one mark for each of the following, up to a maximum of one mark: • More convenient / easier / faster to find / access files • Store related files in a logical way / same directory • Can use the same file name in different directories • Shows path to file / structure	1	1.1a			2
(b)	Award one mark for naming each attribute, up to a maximum of three marks and one mark for each expansion, up to a maximum of three marks: Read-only • When the user is unable to alter the file Archive • When the file no longer in regular use but may be required sometime in the future System • When the file is only used by the operating system (for example a device driver) Hidden • When the user is unable to see the file (for example many files are hidden in Windows as the user cannot view or amend them if you view certain directories) Accept other valid examples	3 3	1.1a 1.1b			6

Q	Answer	Marks	AO1	AO2	AO3	Total
12	Award one mark for each of the following, up to a maximum of six marks: - Start with the second element of the array. - Compare it with the first element and swap if necessary. - this ensures the first two elements are in order. - Move to the third element and insert it into its correct position among the first three elements. - Continue this process for each subsequent element, ensuring each is inserted into its proper place among the already sorted elements. - Iterate through the entire array until all elements are sorted/terminating condition. - The array is now sorted in order.	6	1.1b			6
13	Award one mark for each of the following, up to a maximum of five marks: - Data must be adequate, relevant and not excessive - Data must be accurate and up to date - Personal data stored for no longer than necessary - Processed in line with your rights – individual can check and amend data - Held securely - Data can only be transferred outside EC to countries with adequate DPA - Data is fairly and lawfully processed - Data is processed for limited purposes.	5	1.1b			5

Q	Answer	Marks	AO1	AO2	AO3	Total
14	Indicative content High level • They are easier to understand, learn and program as commands are more English-like • Identifiers can be long and meaningful • They allow the use of powerful commands that perform quite complex tasks • Allows creation of modules that can be re-used and accessed by other parts of the program Low level • Ideal when the execution speed is critical, e.g. boot strap loader • More efficient than high level language programs • Require less time for translation into machine code • Generally result in smaller executable programs (more machine code than necessary) IDE • Editor: this allows a programmer to enter, format and edit source code to produce a program. • Compiler: this converts source code into executable machine code to allow a program to be run. Once compiled, a program can be run at any time. • Interpreter: this converts each line of source code into machine code, and executes it as each line of code is run. The conversion process is required for a program to run and is performed each time the program needs to be run. • Linker: this is a program which allows previously compiled code, from software libraries, to be linked together to produce a single executable program. • Loader: this is a program which loads previously compiled code into memory allowing a program to execute. • Debugger: this is a program that assists in error checking by helping locate, identify and rectify errors in a program. • Trace: this is a facility that assists in error checking by displaying the order in which the lines of a program are executed, and possibly the values of variables as the	12	1.1b			12

Q	Answer	Marks	AO1	AO2	AO3	Total
	program is being run. • Break point: this is a facility that assists in error checking by interrupting a program on a specific line of code, allowing the programmer to compare the values of variables against expected values. The program code can then usually be executed one line at a time. This is called <i>single-stepping</i>. • Variable watch: this is a facility that assists in error checking by displaying the current value of any variable. The value can be 'watched' as the program code is single-stepped to see the effects of the code on the variable. Alternatively a variable watch may be set, which will interrupt the program flow if the watched variable reaches a specified value. • Memory inspector: this is a facility which will display the contents of a section of memory and allows content to be checked for errors. • Error diagnostics: these are used when a program fails to compile or to run. Error messages are displayed to help the programmer more easily diagnose what has gone wrong.					

Band	AO1.1b Max 12 marks
3	Award 9 - 12 marks The candidate has: - written an extended response that has a sustained line of reasoning which is coherent, relevant, and logically structured. - shown clear understanding of the requirements of the question and a clear knowledge of the indicative content. Clear knowledge is defined as a response that provides nine to twelve (up to a maximum of eight for IDE) relevant detailed points on high- and low-level languages and IDEs, which relate to an extensive amount of the indicative content. - addressed the question appropriately with minimal repetition and no irrelevant material. - has presented a balanced discussion and justified their answer with examples. - used appropriate technical terminology referring to the indicative content confidently and accurately.
2	Award 5 - 8 marks The candidate has: - written a response that has an adequate line of reasoning with elements of coherence, relevance, and logical structure. - shown adequate understanding of the requirements of the question and a satisfactory knowledge of high- and low-level languages and IDEs as specified in the indicative content. Satisfactory knowledge is defined as a response that provides five to eight points as signalled in the indicative content. - has presented a discussion with limited examples. - used appropriate technical terminology referring to the indicative content.
1	Award 1 - 4 marks The candidate has: - written a response that that lacks sufficient reasoning and structure. - produced a discussion which is not well developed. - attempted to address the question but has demonstrated superficial knowledge of the topics specified in the indicative content. Superficial knowledge is defined as a response that provides one to four points on high- and low-level languages or IDEs as signalled in the indicative content. - used limited technical terminology referring to the indicative content.
0	Award 0 marks response not credit worthy or not attempted.

Total	100	60	32	8	100
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